

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
11 April 2002 (11.04.2002)

PCT

(10) International Publication Number
WO 02/28560 A3

(51) International Patent Classification⁷: **E21B 33/12.**
F16L 33/16

(21) International Application Number: PCT/US01/31211

(22) International Filing Date: 3 October 2001 (03.10.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/684,412 6 October 2000 (06.10.2000) US

(71) Applicant: **OBI CORPORATION** [US/US]; 3201 Cherry Ridge Dr., Suite C319, San Antonio, TX 78230 (US).

(72) Inventors: **BAILEY, Gary, L.**; 14826 Willow Bend, San Antonio, TX 78232 (US). **WOODS, Ross, S.**; 4959 Shady Oak Trail, Grand Prairie, TX 75052 (US).

(74) Agents: **KAMMER, Mark, A.** et al.; Cox & Smith Incorporated, 112 East Pecan Street, Suite 1800, San Antonio, TX 78205 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

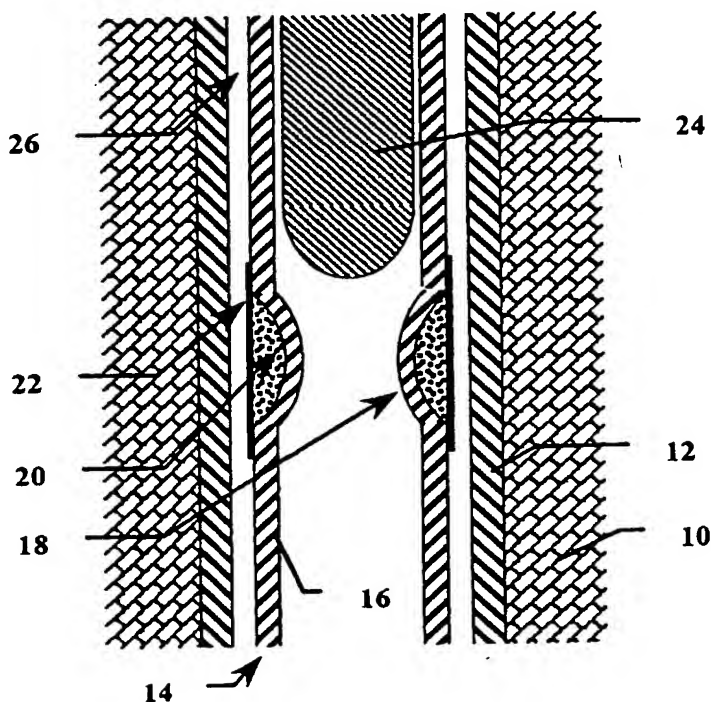
Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
13 June 2002

[Continued on next page]

(54) Title: METHOD AND APPARATUS FOR EXPANSION SEALING CONCENTRIC TUBULAR STRUCTURES



(57) Abstract: An apparatus and method for the sealing of a first tubular member (16) in a fixed position with respect to a second concentric tubular member (12). The inner tubular member (16) is formed with a shallow annular depression (18) in the tube wall at the point of sealant placement, which causes the wall of the inner tubular member to intrude into the otherwise cylindrical passage within the tube. On the outer surface of the first tubular member the depression is filled with a partially compressible fluid (20). The annular depression and the partially compressible fluid are then covered over by a malleable/ductile sleeve (22). Activation of the seal involves directing a cylindrical displacement device (24) through the inside of the inner tubular member and past the annular intrusion such that the wall is straightened. The partially compressible fluid and cover are forced outward into sealing engagement with the outer tubular member.

WO 02/28560 A3



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/31211

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : E21B 33/12; F16L 33/16

US CL : 277/314, 316, 333, 645; 166/187

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 277/314, 316, 333, 645, 332-4, 626, 627, 646; 166/187

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

East: tubes; pipes, compressible fluid, inflatable

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,048,605 A (TOON et al.) 17 September 1991 (17-09-1991), see entire document.	10
A	US 6,102,407 A (MORIYA et al) 15 August 2000 (15-08-2000), see entire document.	1-20
A	US 6,041,858 A (ARIZMENDI) 28 March 2000 (28-03-2000), see entire document.	1-20
A	US 4,651,818 A (JOHNSON et al.) 24 March 1987 (24-03-1987), see entire document.	1-20

☐ Further documents are listed in the continuation of Box C.
 ☐ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Z" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

05 MARCH 2002

Date of mailing of the international search report

11 APR 2002

Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

ALISON PICKARD

Telephone No. (703) 308-1113

THIS PAGE BLANK (USPTO)